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Introduction

The story of the month covers China's efforts on including science in belt and road infrastructure plan. China's industrial policy will become smarter. China's next-generation bullet trains with a maximum operational speed of 400 km/h will be ready by 2020. China sets up national lab developing brain-like AI technology. China completes construction of first Hualong One nuclear project. China's first big data college to offer postgraduate courses was built with the support of Alibaba. Chinese state-owned enterprises (SOEs) establish a 150 billion yuan investment fund in emerging strategic industries. China continues to improve fairness, accessibility of health service. China plans to build an integrated national big data center.

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Story of the Month

China's belt and road infrastructure plan also includes science

(Science, 16-5-2017)

China's plan to make massive investments in land and sea links with global trading partners also includes a little noticed commitment to support science and engineering, including the creation of dozens of new laboratories.

The belt and road initiative—originally announced in fall 2013 and officially dubbed the Silk Road Economic Belt and the 21st-Century Maritime Silk Road—is primarily an economic development program. Chinese President Xi Jinping's pet project, it is heavy on infrastructure—calling for new roads, railways, bridges, and ports—to recreate the overland and maritime trade routes that once led to China. Nearly 70 nations have agreed to cooperate in the plan, which aims to foster industrial development not only in the developing nations of Asia and Africa, but also in China's western provinces, which have yet to share in the economic prosperity of the country's coastal regions.

China is also planning to use the initiative to flex its scientific and engineering muscles, officials made clear at a 2-day Belt and Road Forum for International Cooperation that ended on 15th May in Beijing. "Innovation is an important force powering development," Xi said in a speech to the opening session of the forum. And so the initiative will include technical cooperation in fields including artificial intelligence, nanotechnology, quantum computing, and smart cities. He also mentioned the need to pursue economic growth that is in line with sustainable development goals, and that rests on environmentally friendly approaches.

A science and technology action plan calls for training 5000 foreign scientists, engineers, and managers over the next 5 years, as well as welcoming younger scientists to China on short-term research visits. (That pledge comes on top of a separate program that each year provides 10,000 scholarships to students from developing countries to study in China.) The initiative also calls for setting up 50 joint laboratories, though the research fields and other details are not yet specified. And Xi wants to create a big data service platform on environmental protection, and promises support for countries adapting to climate change.

The Beijing-based Chinese Academy of Sciences (CAS) is on board with the effort. A year ago it formed a Digital Silk Road program that will bring together scientists from 40 countries to cooperate on space-based Earth observations that might help identify and manage natural resources, protect the environment, and prepare for and respond to disasters. And last fall, the academy organized an international symposium that pulled together 50 countries from along the trade routes to explore further opportunities for cooperation. CAS sees the belt and road effort as China "shouldering more international responsibility," academy President Bai Chunli said in a statement prior to the summit.

So far, China has committed some $1 trillion to the belt and road initiative, which will unfold over many years.

(http://www.sciencemag.org/news/2017/05/china-s-belt-and-road-infrastructure-plan-also-includes-science)

News

1. Industrial policy will become smarter

(China Daily, 18-5-2017)

China will focus on smart manufacturing by integrating the Made in China 2025 strategy and Internet Plus initiative with entrepreneurship and innovation to upgrade the country's traditional industries and help advance economic restructuring.

The decision was made at a State Council executive meeting presided over by Premier Li Keqiang on 17th May, when a report on the strategy's implementation was delivered to participants.

Since implementing the strategy in 2015, the nation has seen a steady progress in industrial capabilities, smart manufacturing, innovation, and product quality and branding. A recent example is the passenger jet C919, which made its first test flight earlier this month.

The meeting decided to focus on smart manufacturing and further deploy new technologies such as the industrial internet to make manufacturing a smarter and greener sector offering better services and products.

Average productivity was up by 38 percent for China's first 109 pilot projects in smart manufacturing, while operating costs dropped by 21 percent, according to the Ministry of Industry and Information Technology.

The premier said Made in China 2025, as a crucial part of supply-side structural reform, is vital to moving the country's economy up the value chain. The key is exploiting advantages of China's domestic market and human resources, as well as further promotion of basic research and innovation, he said.

"Implementation of the strategy has introduced strength to the real economy, especially equipment manufacturing. However, we should also remain aware of our weak links since much of the industry is at the middle and lower end of global supply," Li said.

Made in China 2025 was first unveiled in his Government Work Report in March 2015. Two months later, the State Council released a guideline that focused on five key projects, including smart manufacturing, and 10 key fields such as new materials.

Key technologies will be a priority on the agenda, including independent research and development. Innovative development in fields such as new materials and robots will be accelerated.

As of 17th May, the Ministry of Industry and Information Technology has approved pilot regions for the strategy, namely 12 cities such as Ningbo in Zhejiang province and three city clusters in provinces including Jiangsu. Some of them will be designated as the country's demonstration areas, which will get favorable policies in investment, financing and other fields.

(http://www.chinadaily.com.cn/business/tech/2017-05/18/content_29391462.htm)

2. Train capable of 400 km/h ready to boost region's connectivity by 2020

(China Daily, 03-5-2017)

China is working on next-generation bullet trains with a maximum operational speed of 400 kilometers per hour that will be ready by 2020 for markets linked to the Belt and Road Initiative's vision, the country's top railway vehicle maker said.

"We will apply new materials in the research and production of the future high-speed trains, such as carbon fiber and aluminum alloy, which will help reduce weight and enhance energy efficiency," said Qiao Feng, a senior engineer at the CRRC Changchun Railway Vehicles Co, a subsidiary of China Railway Rolling Stock Corp.

The new trains will be available in Belt and Road Initiative markets, and will be able to reduce per passenger energy consumption by 10 percent compared with high-speed trains that can run 350 km/h. The CRRC will be the manufacturer and exporter, according to Qiao.

Once available, by around 2020, the new trains are expected to promote regional connectivity and create new business for China and overseas economies through the Belt and Road Initiative, Qiao added.

Feng Hao, a rail transportation researcher at the National Development and Reform Commission, said that the 400 km/h high-speed train project would help many heavily populated countries change their commuter transportation from a long dependence on automobiles.

"Because many markets along the Belt and Road Initiative, especially in Central Asia, Southeast Asia, the Middle East and Eastern Europe countries, are planning to build high-speed rail lines or to upgrade their existing systems, they are eager to gain technological support from China to assist in daily operations, maintenance and staff training."

China will test the new bullet train alongside a portion of the Beijing-Shenyang high-speed railway line, Qiao said. The test railway line is to be completed by 2019.

Liu Youmei, an academician at the Chinese Academy of Engineering, said it is still not cost-effective to run a high-speed train at 400 km/h domestically because elements such as bearings, electric contacts and track must be replaced more often.

But, he said, with new railway lines and lower costs for parts and service, it will not be a problem.

In the past decade, China has built the world's largest high-speed rail network and become a leader in offering high-speed train products and services. The country has passenger train services running at operational speeds of 200 to 250 km/h and currently has the technology to produce trains with a top speed of 350 km/h, according to the National Railway Administration

Qiao said that once the project is completed and with improvements in technologies and equipment, China can also adopt the new technology at home.

As China already made a breakthrough in high-strength bearings made by Taiyuan Iron and Steel (Group) Co earlier this year, the country will be able to supply parts and equipment to domestic and foreign railway service operators in a more cost-efficient way.

(http://www.chinadaily.com.cn/china/2017-05/03/content_29175985.htm)

3. China sets up national lab developing brain-like AI technology

(China Daily, 14-5-2017)

China's first national laboratory for brain-like artificial intelligence (AI) technology was inaugurated on 13th May in Hefei, capital of East China's Anhui province, to pool the country's top research talent and boost the technology.

Approved by the National Development and Reform Commission in January, the lab, based in China University of Science and Technology (USTC), aims to develop a brain-like computing paradigm and applications.

The university, known for its leading role in developing quantum communication technology, hosts the national lab in collaboration with a number of the country's top research bodies such as Fudan University, Shenyang Institute of Automation of the Chinese Academy of Sciences as well as Baidu, operator of China's biggest online search engine.

Wan Lijun, president of USTC and chairman of the national lab, said the ability to mimic the human brain's ability in sorting out information will help build a complete AI technology development paradigm.

The lab will carry out research to guide machine learning such as recognizing messages and using visual neural networks to solve problems. It will also focus on developing new applications with technological achievements.

(http://www.chinadaily.com.cn/china/2017-05/14/content_29341661.htm)

4. China completes construction of first Hualong One nuclear project

(China Daily, 26-5-2017)

China successfully installed the containment dome for its first demonstration nuclear power project using Hualong One technology, a domestically developed third-generation reactor design, in East China's Fujian province on 25th May.

The hemispherical dome, weighing 340 metric tons and measuring 46.8 meters in diameter, was installed by crane on the No 5 unit of China National Nuclear Corporation (CNNC) in Fuqing City at 5:58 pm.

The installation marks the completion of construction work on the pilot project and the beginning of the assembly stage, said Yu Peigen, deputy general manager of CNNC at the site of installation.

The dome will be used for protection against nuclear accidents under extreme conditions, and both its design and installation are very demanding processes.

"The installation is much more difficult than that of traditional nuclear reactors because the whole weight of the dome and the ropes is more than 500 tons," said Yang Jianguo, the lifting commander at the site.

Construction of the pilot project began in May 2015 and was scheduled to take about 62 months to finish.

The successful installation of the dome will contribute to the development of China's domestic third-generation reactor design and enhance the confidence in Hualong One among countries involved in the Belt and Road Initiative to boost cooperation, said Wang Shoujun, chairman of CNNC.

The country has actively promoted Hualong One at home and abroad. There are now four projects using Hualong One design under construction, including two reactors in Karachi, Pakistan.

During the Belt and Road Forum for International Cooperation earlier this month, CNNC also signed a cooperation framework agreement with Argentina, a key emerging market for Chinese companies, which included using the Hualong One design for the country's fifth nuclear unit.

(http://www.chinadaily.com.cn/china/2017-05/26/content_29506464.htm)

5. Alibaba to help build China's first big data college to offer postgraduate courses

(Global Times, 23-5-2017)

China's first big data college to provide both undergraduate and master's programs will be set up in Chengdu, Southwest China's Sichuan Province, a move to meet the country's future demand for talents as its big data industry develops.

The Chengdu University of Information Technology and Aliyun, Internet giant Alibaba's cloud computing subsidiary, jointly announced in Chengdu on 23rd May during the 2017 Yunxi summit, one of China's largest cloud computing events, that they will work together to build the college.

The Sichuan college will be the third Alibaba big data school but the first to provide postgraduate courses to students, china.com.cn reported.

The college, which is slated to start recruitment in 2018, will cultivate 1,000 advanced talents specializing in sectors including cloud computing, big data security and artificial intelligence within next five years, according to reports.

The college is also expected to provide big data-related training to government officials, businessmen and students, including two of Alibaba's well-recognized global big data talent certification programs.

It is estimated that China will need 1.8 million big data professionals in the next 3 to 5 years, about 1.5 million more than it has now.

(http://www.globaltimes.cn/content/1048287.shtml)

6. Chinese SOEs establish 150 bln yuan investment fund

(Xinhua, 16-5-2017)

China Aerospace Science and Technology Corporation (CASC) has formed a fund of 150 billion yuan (21.8 billion US dollars) with a group of centrally administered state-owned enterprises (SOEs) to invest in emerging strategic industries.

The fund, with an initial pledge of 113.9 billion yuan, will target the 3D printing, aerospace, biological medicine, clean energy, high-speed rail, IT, nuclear energy, power grid, quantum communication, robotics, and shipping industries, among others.

The investment fund was established to improve the SOEs' innovative ability to make breakthroughs in core technology, boost emerging industries and foster new driving forces for growth, and increase cooperation between the SOEs, said CASC chairman Lei Fanpei at the fund's establishment ceremony.

The sponsors include rolling-stock maker CRRC, Industrial and Commercial Bank of China, Postal Saving Bank of China, Shanghai Pudong Development Bank and Beijing municipal government.

(http://news.xinhuanet.com/english/2017-05/16/c_136289098.htm)

7. China to continue improving fairness, accessibility of health service: minister

(Xinhua, 23-5-2017)

China has established for its 1.3 billion people a basic medical care system and will continue improving the fairness, accessibility, quality and efficiency of its health service, a senior Chinese official said on 22nd May.

Li Bin, Minister of the China National Health and Family Planning Commission, shared the experience of China in achieving a better system for health care at the first day of the 70th World Health Assembly (WHA).

China, she said, has been making rapid progresses through a hierarchical medical system, hospital management reform, wider medical insurance, better medicine supplies and comprehensive supervision.

"China emphasizes the establishment of a sound health system through innovation, and gives full consideration to the universality, sociality and integrity of the related factors," she noted.

According to the minister, related authorities like agriculture, education, environment, human resources and social security departments have all joined hands in the public health care efforts so as to form a government-led and demand-oriented health care system.

She said China will arrange closer partnerships between top-tier hospitals and grassroots medical services to provide health management and health care services for urban and rural residents alike in a more inclusive and coherent manner.

The goal for this medical partnership is to make quality medical care more accessible to the wider public, the Minister said, especially in less-developed areas and the grass-root level.

The Chinese government is also planning to take further steps in allocating high quality medical resources to wider regions by dispatching teams of medical professional to less developed areas with enhanced sharing and inter-operating of health and medical services.

As part of the plan, the China National Health and Family Planning Commission recently announced that family doctor services will be extended to over 85 percent of Chinese cities, covering 30 percent of the urban population and over 60 percent of priority groups in 2017.

The 70th WHA, the main decision-making body of the World Health Organization, opened at the Geneva-based UN headquarters on 22nd May.

During the 10-day session, this year's assembly will determine policies on a range of health issues, including medicines and health products, non-communicable diseases, health emergencies, as well as maternal, new-born, child and adolescent health.

(http://news.xinhuanet.com/english/2017-05/23/c_136305829.htm)

8. China to build integrated big data center

(Xinhua, 17-5-2017)

China plans to build an integrated national big data center as the country seeks to tap the value of massive data resources in a more efficient and safer way, an official said on May 17.

The center aims to promote better sharing of public data for wider application, especially for data in sectors such as credit, transportation, health and employment, said Zhang Feng, chief engineer of the Ministry of Industry and Information Technology (MIIT).

China will also study the formulation of a development roadmap for industrial data to push the integration of big data and manufacturing.

China will strengthen security protection in the collection, storing, application and sharing of big data.

Zhang shared the information at an MIIT conference to mark World Telecommunication and Information Society Day on May 17, with "Big Data for Big Impact" as this year's theme.

China's data volume is projected to expand at an annualized rate of over 50 percent and account for 21 percent of worldwide data by 2020.

(http://news.xinhuanet.com/english/2017-05/17/c_136292235.htm)